

MICROORGANISMS AND THEIR USE IN ANIMAL FEEDCross-Reference to Related Applications

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This is a continuation-in-part of copending Application Serial No. 09/637,459, filed August 11, 2000, which is a continuation of copending Application Serial No. 09/125,212, filed ~~August 14, 1998~~, <sup>March 22, 1999</sup>, which is a national stage application of International Patent Application No. PCT/GB97/00433, filed February 17, 1997, which claims priority from provisional Application Serial No. 60/016,988, filed May 7, 1996.

Field of the Invention

10 This invention relates to micro-organisms and their use in animal feed.

Background of the Invention

The use of enzymes and organisms can improve or enhance the performance of animals and the value of the feed the animals receive. For example, WO-A-9210945 discloses such a combination for use in enhancing the 15 value of prepared silage. WO-A-9313786 and WO-A-9617525 relate to enhancement of animal performance using microorganisms; WO-A-93/3786 refers to species of *Lactobacillus*.

It is a common practice in the rearing of beef cattle for the animals to be 'finished' on a feedlot for a period of around 140 days prior to slaughter. The 20 aim of the finishing process is to produce beef in a form most acceptable to the consumer. During finishing, there is an increase in muscle (red meat) mass as well as an increase in the amount of fat. Whilst in the feedlot, the animals are switched to a diet which is high in energy and low in fibre, commonly known as 'concentrates', mostly cereal grains and especially corn (maize). The switch to 25 high levels of carbohydrate-containing feeds can lead to a number of problems, including bloat, acidosis and various ruminal toxicosis symptoms. These conditions can be detrimental to the health of the animal and, in severe cases, can be fatal.

Since the 1980's, direct fed microbials (DFMs) have been utilised in cattle 30 feedlot rations. These include a number of strains of bacteria, fungi and yeast. During the first 10 years of the use of DFMs, *Lactobacillus acidophilus* was one of the most commonly utilised microbial feed additives. When feeding